Hybrid Radiation Length Considerations

	(X/ρ) [cm]
Be	35
H_2O	35
Si	9.4
BeO	14.4
Ag-Pd	.85
glass	10
Cu	1.43
Al	8.96
Au	.33
Kapton	28.4

svt radiation length budget is 3.5%

=3 layers x ([wafers]+2/3[hybrid+Be water channel])

=3[wafers]+2hybrid+2Be water channel

.03cm thick wafers → .33%

.15cm Be water channel → .43%

=1.85%+2hybrid

Hybrid

.05cm BeO substrate.	.35%
ic's	
15 pasa's(2.4mm x 3.3mm x .3mm)	
15 sca's(3.0mm x 3.7mm x .5mm)	
buf04 ic's(1.9mm x 1.7mm x .3mm)	
cmos(1.5mm x 1.4mm x .3mm)	
pecl(1.5mm x 1.2mm x .3mm)	
capacitors (assume 6%area,1mmthick, "glass")	
dielectric	.15%
assume 3 .005cm thick "glass" layers	
Ag-Pd	.35%
Two 15-micron thick layers	
Cu Kapton Cable(weighted average)	.23%
(note: complicated formula used, actual contrib. is .076% for 6cm of cable on one hybrid)	
Hybrid Total	1.21%

1.85%+2hybrid=4.3%

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